

**WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY**  
Subcontract No: 1048, LMI Task No: MAN0B.04, for the U.S. Army Environmental Policy Institute

**SEPTEMBER 2010 REPORT**

Note to Readers: Pages 1-14 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 15.

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**Item 1. Strategic Plan for Biodiversity to Connect UN Conventions and UN Bodies**

Representatives of biodiversity-related conventions met for the first time on September 1, 2010 in Switzerland to improve international environmental governance. Participants agreed that the 2011-2020 strategic plan should provide a framework for all biodiversity-related conventions and UN bodies. Capacity-building activities should be coordinated among the conventions, and national biodiversity strategies and action plans updated to cover implementation of all biodiversity-related conventions. The Strategic Plan is expected to be adopted at the 10<sup>th</sup> meeting of the COP to be held in October 2010, in Nagoya, Japan. A Nordic symposium on synergies among biodiversity-related MEAs, held earlier this year in Helsinki, noted that considering impediments, six conventions form a potentially manageable and coherent cluster: CBD, CITES, CMS, Ramsar, WHC and ITPGRFA, while the CBD, UNFCCC and UNCCD cluster would assure a better integration of biodiversity with climate change issues. (See [Appendix](#) for the definition of acronyms and abbreviations) Enhancing cooperation and coordination among the biodiversity-related MEAs follows the success of the synergies developed among the three on chemicals and waste—the Basel, Rotterdam and Stockholm Conventions (see *First Joint Meeting of the Main Conventions on Hazardous Chemicals to Improve International Environmental Governance* in February 2010 report).

**Military and Related Security Implications:**

Increased coherence among biodiversity agreements, UN-related bodies, and capacity building should lead to greater attention being paid to biodiversity impacts of military training and other operations. Military liaisons should explore opportunities for cooperation and applications of the Army Strategy for the Environment as this integration evolves with monitoring and enforcement organizations.

**Sources:**

First high level retreat among secretariats of biodiversity-related Conventions. 1 September 2010, Château de Bossey, Switzerland. Summary of the Retreat

<http://www.cbd.int/cooperation/doc/report-hlr-2010-09-01-en.pdf>

Ministerial forum calls for leadership for a new biodiversity vision for the twenty-first century

<http://www.cbd.int/doc/press/2010/pr-2010-09-03-minister-forum-geneva-en.pdf>

**Item 2. Environment-related Issues Dominate the UN General Assembly Debate**

The need for increased and coordinated efforts from all countries to address climate change, vulnerability to natural disasters, and threats to biodiversity was the most frequent theme of the speeches of heads of state and governments addressing the UN General Assembly held 23-25 and 27-30 September 2010, and will probably top the 65<sup>th</sup> session's agenda.

**Military and Related Security Implications:**

Military and security organizations should increase efforts to identify ways to cooperate with relevant international and national organizations in addressing the causes and effects of climate change, forecast how they might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. The increasing attention being accorded to the general relationships between environment and security makes it increasingly probable that UN

peacekeeping operations will be mandated to deal with environmental issues. If so, then increasing military-to-military assistance and training in these matters will be needed.

**Sources:**

General Assembly of the United Nations. General Debate: 65th Session, statements

<http://gadebate.un.org/>

Security Council holds first strategic reassessment in nearly 20 years

<http://www.un.org/apps/news/story.asp?NewsID=36107&Cr=security+council&Cr1=>

We can end poverty 2015. UN Summit, 20-22 September 2010

<http://www.un.org/en/mdg/summit2010/>

### **Item 3. The UN and African Union to Increase Cooperation for Peace and Security**

The UN and the African Union (AU) launched a Joint Task Force on peace and security for improving conflict prevention, peacekeeping, and peacebuilding across the continent (expanding their present efforts in Sudan, Guinea, and Somalia.) The task force will meet twice a year at the senior level to review immediate and long-term strategic issues, and its program of work will be set in coordination with the UN Office to the AU and the AU's Permanent Observer Mission to the UN. The first high-level meeting of the Africa-European Union Energy Partnership was held September 14-15, 2010, in Vienna, Austria, addressing cooperation on energy security and renewable energy issues. The over 300 participants, including ministers and high-level representatives from 24 European and 33 African countries, also agreed upon concrete targets and objectives.

**Military and Related Security Implications:**

If not already done, AFRICOM and other military and security entities in Africa should connect with the Joint Task Force and the Energy Partnership for better integration of all security-related activities.

**Sources:**

UN and African Union launch joint task force on peace and security

<http://www.un.org/apps/news/story.asp?NewsID=36192&Cr=African+Union&Cr1=>

First High-Level Meeting of the Africa-EU Energy Partnership

<http://www.iisd.ca/ymb/energy/aeep/>

First High Level Meeting of the Africa-EU Energy Partnership

<http://www.aeep-conference.org/>

AfDB's Response to Climate Change in Africa

<http://www.afdb.org/en/news-events/article/afdb-response-to-climate-change-in-africa-7165/>

### **Item 4. Pacific Region Programs for Addressing Environmental Security**

The Pacific Regional Environment Programme (PREP) adopted the Strategic Plan for 2011-2015 at its 21<sup>st</sup> meeting held in Madang, Papua New Guinea, September 6-10, 2010. It creates a framework for regional environmental cooperation on climate change; biodiversity and ecosystem management; waste management and pollution prevention; and environmental monitoring and governance. The Asian Development Bank's paper, *Focused Action: Priorities for Addressing Climate Change in Asia and the Pacific*, outlines similar priorities for its work

on clean energy, sustainable urban development, land use and forest management for carbon sequestration, climate-resilient development promotion, and strengthening of related policies and institutions.

**Military and Related Security Implications:**

Military and security entities in Asia should consider collaboration with these and similar organizations and ensure that their strategies are taken into account when addressing security issues in the region. Also, it is important to cooperate with the priorities set by the PREP Secretariat and the eventual new regulations that might result from the Strategic Plan.

**Sources:**

Pacific Environment Ministers' Communiqué

[http://www.sprep.org/article/news\\_detail.asp?id=822](http://www.sprep.org/article/news_detail.asp?id=822)

Focused Action: Priorities for Addressing Climate Change in Asia and the Pacific

<http://www.adb.org/documents/brochures/climate-change-priorities/default.asp>

**Item 5. Robot Planes for Environmental Monitoring and Warfare Raise Legal Concerns**

Robot planes are proliferating, as are moral and legal concerns regarding their use. The European Space Agency's Business Incubation Centre at Darmstadt, Germany, and a German start-up company, MAVinci, have developed an unmanned aircraft system guided by satellite navigation (satnav) that uses autonomous micro-air vehicles (MAVs) with a wingspan of less than two meters, to inspect land areas. Boeing's Phantom Works' Vulture II program is developing Solar Eagle, a demonstration solar-powered unmanned aerial vehicle (UAV) that will make its first flight in 2014, and is designed to lead to a large vehicle that can remain on station in the upper atmosphere for up to five years. An analogous effort is the hydrogen-powered demonstrator, Phantom Eye, designed to stay aloft for up to four days and scheduled to make its first flight in 2011. These are only a few of the latest advancements in remote-controlled warfare with promising positive environmental and security results. Nevertheless, recently, a trial in a Las Vegas court against the anti-drone protesters group Creech 14, who allegedly trespassed onto Creech Air Force Base in April 2009, was delayed for four months. This sets the stage for a debate concerning the eventual need for clear regulations regarding the circumstances for using remote-controlled warfare components.

**Military and Related Security Implications:**

Development of unmanned aircraft for environmental monitoring and warfare should consider built-in systems that would assure the respect of basic regulations such as those included in the Geneva Convention, for avoiding human victims and environmental damages. With the proliferation of UAV's, special attention should be given to preventing their misuse by non-state actors.

**Sources:**

Satellite navigation steers unmanned micro-planes

[http://www.esa.int/esaCP/SEMMUZDODDG\\_index\\_0.html](http://www.esa.int/esaCP/SEMMUZDODDG_index_0.html)

The solar-powered spy plane that will be able to fly non-stop for FIVE years

<http://www.dailymail.co.uk/sciencetech/article-1313552/The-solar-powered-spy-plane-able-fly-n-on-stop-FIVE-years.html>

Vegas Drone Trial Makes History

<http://www.justicewithpeace.org/node/1763>

The law versus justice. Vegas anti-drone trial makes history

[http://www.lasvegascitylife.com/articles/2010/09/23/news/local\\_news/iq\\_38222529.txt](http://www.lasvegascitylife.com/articles/2010/09/23/news/local_news/iq_38222529.txt)

## **Item 6. Technological Advances with Environmental Security Implications**

### **6.1 Carbonates for Construction Drawn from Carbon Dioxide**

Utilizing funding from Italian energy company Eni, Prof. Angela Belcher of MIT and two graduate students have developed a bench-scale, biological process to remove CO<sub>2</sub> from the environment and transform it into solid carbonate. The procedure produces approximately two pounds of carbonate for each pound of CO<sub>2</sub>, without the use of heating, cooling, or toxic chemicals. The MIT group plans to test scaling the process by applying it to the CO<sub>2</sub> emissions at a fossil-fuel-burning power plant. They also believe the process's mineral ions can be obtained from briny water that is a byproduct of water desalination.

#### **Military and Related Security Implications:**

The military should follow this work for potential application to CO<sub>2</sub> reduction programs, water desalination plans, and construction projects. Any evaluation must consider how the metal ions required to produce insoluble carbonates are to be obtained without creating new environmental hazards.

#### **Source:**

Putting carbon dioxide to good use

<http://web.mit.edu/newsoffice/2010/belcher-carbon-0922.html>

### **6.2 Advances in Wireless Location Detection**

MIT's Laboratory for Information and Decision Systems (LIDS) is developing an exploratory model of wireless "limits" that has relevance for improved, practical, high resolution location communication applications, which can utilize low cost, limited battery life mobile devices. The researchers say this is the first study of its kind and that they have "designed novel location-aware networks with sub-meter accuracy and high reliability" by calculating optimal efficiencies of signal detection within various wireless positioning systems. The group's work will appear as a pair of papers in the *IEEE Transactions on Information Theory* October issue.

#### **Military and Related Security Implications:**

The military should follow this research for its future applicability to device and personnel tracking within field and office milieus. Security organizations should also assess what these advances may mean in terms of the additional readiness and ability of terrorists/extremists to threaten disruption and/or violence.

#### **Source:**

Can you find me now?

<http://web.mit.edu/newsoffice/2010/location-sensing-0909.html>

### 6.3 New Detection and Cleanup Techniques

#### 6.3.1 Autonomous Network of Sea Skimmers Could Speed Oil Spill Cleanup

According to an article in *Nanowerk News*, the SENSEable City Laboratory at MIT has developed one prototype unit of a proposed fleet, Seaswarm, of autonomous solar-powered robot vessels, each of which moves a conveyor belt covered with a thin absorbent nanowire mesh over the sea surface to remove oil. The fabric can absorb up to twenty times its own weight in oil while repelling water. By heating the material, the oil can be removed and the nanofabric reused. The "swarm" would use GPS and a communications network to self-manage a coordinated attack on a spill.

#### **Military and Related Security Implications:**

This is a promising development to add to the set of tools for remediating oceanic oil spills. It should be assessed for utility in diverse real-world conditions.

#### **Source:**

MIT uses nanotechnology to build autonomous oil-absorbing robot

<http://www.nanowerk.com/news/newsid=17787.php>

#### 6.3.2 New Technique Provides Simple, Sensitive Analysis of Aerosols

Dr. Patrick Roach and colleagues at DOE's Pacific Northwest National Laboratory, Richland WA, have announced a new technique, Nanospray-Desorption/Electrospray Ionization (NanoDESI) for introducing aerosols into a mass spectrometer for detailed analysis of their molecular content. This single, generally applicable method, unlike former ones, does not require expert technicians or significant sample preparation.

#### **Military and Related Security Implications:**

This improved technology should significantly simplify the task of identifying and controlling aerosol contaminants in the atmospheric environment. The technique should be evaluated by materiel developers, preventive health entities, and environmental managers for adaptation to identifying and quantifying chemical/biological war agents and environmental pollutants.

#### **Sources:**

Molecular Characterization of Organic Aerosols Using Nanospray-Desorption/Electrospray Ionization-Mass Spectrometry

<http://pubs.acs.org/doi/abs/10.1021/ac101449p>

New technique provides sensitive analysis of atmospheric particles

<http://www.nanowerk.com/news/newsid=18004.php>

## Item 7. Updates on Previously Identified Issues

### 7.1 Natural Resources Fuel Violence in Eastern D.R. Congo

Approximately 500 citizens in eastern Democratic Republic of the Congo were attacked by militias allegedly including Rwandan and Congolese rebel forces. The attacks occurred in several areas of the Kivu provinces at the epicenter of mineral mining activities and in proximity to forests and forest preserves where illegal timber logging and rare mineral extraction have historically fueled conflict. UN aid workers estimate that 890,000 people are internally displaced in the provinces, while UN Assistant Secretary-General for Peacekeeping Atul Khare indicated



that current security forces in the region have been unable to maintain their peacekeeping mandate, which includes the protection of civilians and, by extension, control of natural resources through training and other military assistance to the government. Meanwhile, reports from international agencies, including the World Bank, have concluded that weak legal, financial, and policy frameworks in D. R. Congo discourage formulation of national development goals that can be aligned with judicious natural resource use. The weakness also inhibits implementation of effective control mechanisms for natural resource stewardship, including an inability to monitor, evaluate, and secure the use of land for productive agricultural purposes. [Related item: *The Race for Natural Resources a Potential Impediment for Peace* in June 2010 environmental security report.]

**Military and Related Security Implications:**

AFRICOM should cite this situation to policymakers in the region to encourage implementation of military-to-military programs to address environmental degradation that could trigger security issues. Similar actions should be taken in collaborations with peacekeeping forces. Since the factors that lead to these conflicts are increasing, it would be wise to create a collective intelligence system to identify and assess better approaches with and for all relevant stakeholders in the region.

**Sources:**

Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?

[http://siteresources.worldbank.org/INTARD/Resources/ESW\\_Sept7\\_final\\_final.pdf](http://siteresources.worldbank.org/INTARD/Resources/ESW_Sept7_final_final.pdf)

MONUSCO Mandate

<http://www.un.org/en/peacekeeping/missions/monusco/mandate.shtml>

UN has failed Congo mass rape victims, says investigator

<http://www.guardian.co.uk/world/2010/sep/08/congo-mass-rape-500-khare>

DR Congo: UN mission chief concerned over violence in troubled North Kivu

[http://www.isria.com/RESTRICTED/D/2010/SEPTEMBER\\_24/23\\_September\\_2010\\_62.php](http://www.isria.com/RESTRICTED/D/2010/SEPTEMBER_24/23_September_2010_62.php)

**7.2 Protests in Peru over Dam Irrigation and Hydroelectric Project Part of a Regional Picture**

A major Peruvian irrigation and electricity project that includes diversion of water from the Apurímac River is protested by local citizens who claim they were not consulted during the tender process and that the project will destabilize their water source. A Spanish-Peruvian consortium received a concession to dam and divert water for irrigation and electricity capacity to encompass approximately 66,000 hectares (163,000 acres) of new land and to generate more than 500 Mw of power. The Majes-Sigüas Special Project does not appear to require contractual provisions for the benefit of local populations. An environment ministry official said that there are around 1,000 ongoing conflicts over water in this one region, of which more than 40 are potentially serious. [Related items: *International Lawsuits for Environmental Crime Proliferate* in January 2010, and *Indigenous Peoples Demand More Involvement in Environmental Policies* in May 2008 environmental security reports.]

**Military and Related Security Implications:**

Southern Command's Public Private Cooperation program should reach out to the concession holders and Peruvian government to encourage a long-term partnership that honors the rights of local citizens. This could include education and training in relevant civil-military issues so that, if and when called upon, they can be effective immediately.



**Sources:**

Have the climate wars begun?

<http://www.guardian.co.uk/global-development/poverty-matters/2010/sep/21/climate-wars-machu-picchu-irrigation>

Cusco joins Espinar strike against Majes-Siguas project

<http://www.livinginperu.com/news-13201-outside-of-lima-peru-cusco-joins-espinar-strike-against-majes-siguas-project>

**7.3 Chinese Rare Earth Restrictions**

China announced it is reducing its annual rare earth exports by 40%. This limits shipments to a little over 30,000 tonnes, which is 15,000-20,000 tonnes less than consumption by non-Chinese producers. Prices of the minerals have skyrocketed over the past year (see graph in the [Appendix](#)), and countries are searching for replacement sources; possibilities include the U.S., Australia, Vietnam, Kazakhstan, Afghanistan, and Tanzania. The export curtailment follows a period of low Chinese prices that caused many countries' mines to be dismantled and closed completely. The rate of discovery or reactivation for sources may be enough to prevent shortages; however, some of these countries have problems of stability, finances, qualified work force, and environmental policies, since the extraction of these elements involves the use of highly toxic chemicals. [Related item: *China Applies for Seabed Mining Permit in Search for New Mineral Resources* in July 2010 environmental security report.]

**Military and Related Security Implications:**

Even though new sources for rare earths look promising, it would be wise to continue R&D for substitutes. One can reasonably ask whether the Chinese action is a market aggression test to determine how far they can press their rare earth mineral resource advantages.

**Sources:**

Rare earths. Digging in. China restricts exports of some obscure but important commodities

<http://economist.com/node/16944034>

The Application of Rare Earth Metals is Widening Despite Lack of Engineering Data

<http://www.docstoc.com/docs/5379510/rare-earth-elements>

New Deposits of Rare Earths Ores in Tanzania Substitute for China?

<http://agmetalmminer.com/2010/04/08/new-deposits-of-rare-earths-ores-in-tanzania-substitute-for-china/>

**7.4 European Parliament Resolution on Jordan River Water Management Reform**

The European Parliament has adopted a resolution on environmental and political concerns with regard to the Lower Jordan River area. It calls upon the leaders of Israel, Jordan, and Syria to address the humanitarian, security, and environmental threats posed by the Jordan River's over-exploitation and mismanagement. An estimated 98% of the river's freshwater has been redirected by Israel, Jordan, and Syria. Without intervention, large portions of the river are projected to run dry by 2011. This non-binding resolution opens the first official communication between the EU Parliament and these governments regarding the state of the Jordan River. [Related item: *Call for International Intervention to Save the Jordan River* in May 2006 environmental security report.]

**Military and Related Security Implications:**

Previous collaborations on water issues helped ameliorate conflict situations in several regions, including the Middle East. Environmental diplomacy and international military cooperation

should be used to explore how to turn around the deterioration of the Jordan River and use this opportunity to further confidence and peace building. Additionally, military-civilian policy research is needed to clarify when intervention should be initiated to prevent or halt actions whose most likely result is inter-state or intra-state violence.

**Sources:**

Situation of the Jordan River with special regard to the Lower Jordan River

area: <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2010-0314&format=XML&language=EN>

European Parliament passes historic resolution in support of regional rehabilitation of the Lower Jordan River

[http://foeme.org/www/?module=media\\_releases&record\\_id=85](http://foeme.org/www/?module=media_releases&record_id=85)

**7.5 Nordic Countries to Support Mekong Energy and Environment Partnership**

The Ministry for Foreign Affairs of Finland and the Nordic Development Fund are supporting the Energy and Environment Partnership for the Mekong region, a program to promote the use of renewable energy, energy efficiency, and clean technologies in Cambodia, the Lao PDR, Thailand, and Vietnam. [Related items on the Mekong region: *Climate Change Requires Water Management Changes* in February 2010 and *Unless Water Management Improves, Conflicts over Water Are Inevitable* in August 2006 environmental security reports.]

**Military and Related Security Implications:**

The Energy and Environment Partnership can also be used for confidence building and conflict prevention in the vulnerable Mekong region. Although at present this is an exclusively Nordic project, U.S. environmental organizations should investigate to determine if they could usefully participate in this cooperative effort.

**Source:**

Finland to provide clean-up solutions for environment

<http://vietnamnews.vnagency.com.vn/Environment/203445/Finland-to-provide-clean-up-solutions-for-environment.html>

**7.6 Extinction Threatening 21% of Africa's Freshwater Species Could Have Security Implications**

According to the Red List by the International Union for Conservation of Nature (IUCN), 21% of all African freshwater species are currently under threat of extinction due to such factors as pollution, deforestation, and overfishing. The assessment was carried out over five years by 200 scientists who investigated over 5,000 species. Their report indicates that species extinction is directly related to food security in Africa and that a “whole systems” approach is required to ensure that infrastructure and agricultural development projects in Africa include freshwater management for biodiversity. [Related items: *Biosafety Protocol Advances* in February 2010, and *Food and Water Security* in June 2008 environmental security reports.]

**Military and Security Related Implications:**

Military personnel with African environment and water responsibilities should review this IUCN assessment for their region to help plan and implement sustainable projects that do not disrupt local food and material supplies. Since there are procedures for protecting some land animal and ocean fishing zones, procedures for protecting inland fish stocks should be considered.

**Source:**

African fresh water species threatened – livelihoods at stake

<http://www.iucn.org/knowledge/news/?5898/African-freshwater-species-threatened---livelihoods-at-stake>

**7.7 New Regulations for Chemicals in California**

California's Department of Toxic Substances Control (DTSC) is moving ahead with the regulation development phase of the state's Green Chemistry Initiative (AB 1879 and SB 509) to identify and prioritize chemicals for reduction or removal from consumer products. The preliminary list of Priority Chemicals will be published for public comment by June 1, 2012. The initiative is part of the larger state effort to regulate chemicals and includes the creation of a scientific advisory panel and toxics information clearinghouse with an Internet database component. Another California bill (revised SB 346) expected to get the governor's approval is a complex legal compromise which limits the content of copper and other materials, such as lead, mercury, chromium and cadmium in brake pads. [Related item: *New Substances Identified as Harmful to Human Health and the Environment* in June 2009 environmental security report.]

**Military and Related Security Implications:**

It is fair to speculate that California's chemicals initiatives may set a precedent and be emulated by other states and at international levels. Military personnel with procurement responsibilities should monitor progress and ensure compliance with pending regulations and be prepared for additional restrictions.

**Source:**

California Issues New Green Chemistry Requirements for Consumer Products

<http://www.mofo.com/files/Uploads/Images/100915-Green-Chemistry-Requirements.pdf>

Copper in brake pads out to protect water, fish

<http://www.signonsandiego.com/news/2010/aug/28/copper-brake-pads-out-protect-water-fish/>

**7.8 Climate Change****7.8.1 Scientific Evidence and Natural Disasters**

A report by the Russian Federal Service for Hydrometeorology and Environmental Monitoring revealed that over the past century, the country's average temperature rose almost twice as fast as the global average and nearly three times faster in parts of Siberia during the winter.

The U.S. National Oceanic and Atmospheric Administration notes that the Atlantic Ocean was considerably warmer this year, with temperatures in some parts being 3°F above the average by the end of August. The National Hurricane Center identified 15 tropical cyclones by the end of September, including seven hurricanes compared with two in an average season when waters are cooler. The Center predicts that by the end of the 2010 Atlantic hurricane season, there will be about 20 storms with at least 39 mph winds, compared with 11 in a typical year. These storms are serious threats to offshore oil facilities, as well as coastal communities. According to the New York-based Insurance Information Institute, eight of the ten most expensive U.S. catastrophes were caused by hurricanes.

### 7.8.2 Food and Water Security

According to the latest estimate, the number of hungry people worldwide decreased in 2010 to 925 million, from 1.023 billion in 2009, but is still unacceptably high, says the FAO and the World Food Programme.

At the emergency meeting convened on September 24<sup>th</sup> in response to the wheat export ban in Russia and food riots in Mozambique which killed 13 people, experts from FAO Member States agreed that there was no indication of an impending world food crisis. Nevertheless, recognizing that unexpected price hikes “are a major threat to food security” it was agreed that new measures to limit food price volatility and manage associated risks should be explored. Among the root causes of volatility, the meeting identified “Growing linkage with outside markets, in particular the impact of ‘financialization’ on futures markets”. The paper “Food Commodities Speculation and Food Price Crises” by Olivier De Schutter, UN’s special rapporteur on food, warns that the increases in price and the volatility of food commodities can be explained only by the emergence of a “speculative bubble.” In the meantime, ActionAid cautions that hunger could cost poor nations \$450 billion a year – more than 10 times the amount needed to meet the Millennium Development Goal on halving hunger by 2015. At the “Securing Future Food” meeting convened by the UK Food Group, De Schutter said that the only long-term way to resolve the crisis would be to shift to “agro-ecological” ways of growing food that do not depend on fossil fuels, pesticides, or heavy machinery.

According to the World Bank report *Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?* investment overseas in agricultural land has increased tenfold since the 2008 food price rise. While large-scale farmland deals have the potential to deliver benefits to developing countries, the report warns against practices that harm the rights and opportunities for development of local people. Noting that the trend of overseas investment in agricultural land is likely to continue to grow, the report outlines seven principles for responsible agro-investment, including transparency, food security, and social and environmental sustainability.

The International Water Management Institute (IWMI) released a paper that describes the need for systematic planning in water storage and management to cope with increased rainfall variability. Although water storage increases water security, agricultural productivity, and adaptive capacity, the paper warns that poorly planned storage is a waste of financial resources and may aggravate climate change impacts. It calls for systems that combine complementary storage options and urges consideration of uncertainty in planning.

### 7.8.3 Adaptation

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has launched a Regional Cooperative Mechanism on Drought Monitoring and Early Warning. The Mechanism will provide an information portal--the Asia-Pacific Gateway on Disaster Risk Reduction and Development -- and aims to provide satellite products for drought monitoring. It will assist members in developing locally tailored services to facilitate decision making.

“The World Disasters Report 2010” by the International Federation of Red Cross and Red Crescent Societies focuses on urbanization and climate change risk. It highlights that 2.57 billion urban dwellers living in low- and middle-income nations are exposed to unacceptable levels of risk fuelled by rapid urbanization, poor local governance, population growth, and poor health services. Urban planning should consider the effects of climate change to reduce vulnerability of

millions of people, mostly those living in low-elevation coastal zones. Tackling urban risk is essential to reducing poverty and urban violence.

#### 7.8.4 Arctic Dialogue

"The Arctic: Territory of Dialogue" forum was hosted by the Russian Geographical Society on September 22-23, 2010, attended by foreign and Russian scientists, political figures, NGOs, and business representatives. The main purpose of the forum was to discuss potential international cooperation in the Arctic. The Russia-Norway treaty was cited as an example several times. While highlighting that in 50 years the Arctic may become a major source of energy and a key transportation route, Vladimir Putin noted that priorities should be creating comfortable life conditions for the people living in the region, and respect for the fragile ecosystem by "the most stringent environmental requirements," as well as development of research and environmental infrastructures. Well-known polar explorer and state Duma deputy Artur Chilingarov suggested that the forum should become a regular event, and a Polar Decade launched. Experts also noted the need to create a single global database on the Arctic, while Russian Emergencies Ministry Sergey Shoygu (who is also president of the Russian Geographic Society) said that an atlas of the Arctic would be prepared soon. Along the same lines, the statement produced by the 9<sup>th</sup> Conference of Parliamentarians of the Arctic Region, hosted by the European Parliament in Brussels, September 13-15, 2010, highlights the need for continuous improvement of the assessment of the social and economic consequences of natural resource exploration and exploitation, consequences of climate change for Arctic populations and wildlife habitats, cooperation in education and research, and the tighter economic and geopolitical links.

#### 7.8.5 Post-Copenhagen Negotiations

In preparation for the next session discussing the commitments for the Annex I Parties, to be held in Tianjin, China, October 4-9, 2010, the UNFCCC Secretariat has published several documents, including a draft proposal with amendments to the Kyoto Protocol <http://unfccc.int/resource/docs/2010/awg14/eng/12.pdf>.

#### **Security Implications:**

[Same as previous on this issue] The military should identify all its resources and programs for reducing GHGs and responding to effects of climate change, update information continuously, forecast how it might be called upon for both mitigation and adaptation, and perform a gap analysis in anticipation of future requests. International discourse over climate change is increasing the development of international policies and strategies to mitigate and adapt to climate change.

**Sources:** (see a more expanded list in the [Appendix](#))

Medvedev's Climate Moment

<http://www.themoscowtimes.com/mobile/article/413772.html>

National Hurricane Center

<http://www.nhc.noaa.gov/2010atlan.shtml>

925 million in chronic hunger worldwide

<http://www.fao.org/news/story/en/item/45210/icode/>

Food price volatility a major threat to food security

<http://www.fao.org/news/story/en/item/45690/icode/>

ActionAid report “Who’s really fighting hunger?”

<http://www.actionaid.org/assets/pdf/ActionAid-scorecard-report-2010.pdf>

*Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?* Report

[http://siteresources.worldbank.org/INTARD/Resources/ESW\\_Sept7\\_final\\_final.pdf](http://siteresources.worldbank.org/INTARD/Resources/ESW_Sept7_final_final.pdf)

*Water Storage in an Era of Climate Change: Addressing the Challenge of Increasing Rainfall Variability*

[http://www.iwmi.cgiar.org/Publications/Blue\\_Papers/PDF/Blue\\_Paper\\_2010-final.pdf](http://www.iwmi.cgiar.org/Publications/Blue_Papers/PDF/Blue_Paper_2010-final.pdf)

World Disasters Report 2010 - Is urban the new rural?

<http://www.ifrc.org/publicat/wdr2010/index.asp>

Putin identifies Russia’s priorities in Arctic

<http://www.itar-tass.com/eng/level2.html?NewsID=15522974&PageNum=0>

Russia to draw up new Arctic atlas

<http://en.rian.ru/science/20100922/160679591.html>

9th Conference of Arctic Parliamentarians, European Parliament, Brussels, Belgium

<http://www.europarl.europa.eu/arcticparl/>

Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol

Fourteenth session, Tianjin, 4–9 October 2010

<http://unfccc.int/resource/docs/2010/awg14/eng/12.pdf>

## 7.9 Nanotechnology Safety Issues

More detailed descriptions of the following nanotechnology issues are in the [Appendix](#)

- OECD’s Current Developments/Activities on the Safety of Manufactured Nanomaterials, review of current developments in nanomaterial safety ([more](#))
- EPA’s Significant New Use Rules (SNUR) for single- and multi-walled carbon nanotubes ([more](#))
- EU is Gearing Up for Active Nanotech Regulatory Year in 2011 ([more](#))
- The 4<sup>th</sup> International Nano Authorities Dialogue focused on legal and technical issues about the insurability and regulation of nanotechnologies ([more](#))
- Nanotechnology and Food Safety study by the Government of Hong Kong ([more](#))
- Lack of nanoparticle characterization and biosafety evaluation obstruct the development of nanomedicines ([more](#))
- Defining nanomaterials to satisfy all actors proves to be challenging ([more](#))
- *Engineered Nanoparticles: Current Knowledge about Occupational Health and Safety Risks and Prevention Measures*, report by the Institut de recherche Robert-Sauvé en santé et en sécurité du travail in Montreal, Canada ([more](#))
- Articles discussing U.S. regulations of nanotechnology ([more](#))
- The German Federal Institute for Risk Assessment has published three reports on German opinions and attitudes about nanotechnology-related risks ([more](#))
- Nanosilver compound turns up in municipal wastewater ([more](#))
- Joint research laboratory, NAUTILE (NAnotUbes et écoToxIcoLogiE) set to study the ecotoxicological impact of carbon nanotubes in aquatic environments ([more](#))



## **Item 8. Reports and Information Suggested for Review**

### **8.1 FAO Launches Global Fire Information Management System**

The UN Food and Agriculture Organization has launched the Global Fire Information Management System (GFIMS), a monitoring system that integrates remote sensing and GIS technologies to deliver MODIS hotspot/fire locations to natural resource managers and other stakeholders around the world. (MODIS is the Moderate Resolution Imaging Spectroradiometer on NASA's Aqua satellite). It is offering almost real-time detection of emerging fires, and alerting users through an online portal or via e-mail, and soon by text messages.

#### **Military and Related Security Implications:**

The GFIMS system could help save lives and livelihoods and reduce environmental disasters caused by fire, thus reducing factors that could lead to, or exacerbate conflict situations. Relevant military and security personnel involved in environmental security operations should ensure that they are making full use of GFIMS's capabilities.

#### **Sources:**

Poor to benefit from global fire monitoring system

<http://www.scidev.net/en/news/poor-to-benefit-from-global-fire-monitoring-system.html>

GFIMS: <http://www.fao.org/nr/gfims/gf-home/en/>

### **8.2 Environmental Aspects Should Be Factored More Into Conventional Security Concerns**

In a Capitol Hill briefing, defense experts underlined that environmental degradation and the fight for natural resources threaten U.S. security in the 21<sup>st</sup> century, as depletion of resources exacerbates political instability and conflict in the developing world, increasing the number of failed states. Therefore, integrating environmental problems into security policy is essential and should be on a par with conventional security aspects. For many defense officials in developing countries, security is seen in terms of food, water, and environmental security, and natural disasters. Along the same lines, an article on Pakistan questions the justification of funds allocated to conventional security compared to those for human or environmental security. In 2010, Pakistan's defense budget will rise 17%, to \$5.2 billion, while the week of flooding has by far surpassed the devastation of anything the Taliban could accomplish. The article notes that this is a dilemma of much of the developing world, mostly affecting those vulnerable to climate change and disasters. "Without neglecting the very real challenges posed by insurgency, civil war, or external invasion, the time has come to begin shifting resources toward human and environmental security," says the article.

#### **Military and Related Security Implications:**

While these are only reinforcing issues already on the agenda of defense and security organizations, they provide new motivations for increased attention to human and environmental security as main components of 21<sup>st</sup> century global security. Continued and expanded training is needed to ensure that any force sent to a conflict or disaster zone is competent enough to at least 'do no harm' to the environment, as much as possible.

#### **Sources:**

Environment key to U.S. security: Congress briefing

<http://www.reuters.com/article/idUSTRE68L5NR20100922>



Conventional versus Human Security: How Climate Risks Decrease Stability

<http://pisaspeak.wordpress.com/2010/09/04/conventional-versus-human-security-how-climate-risks-decrease-stability/>

### **8.3 World Energy Outlook 2010**

The World Energy Outlook 2010 is looking at alternatives for switching to a reliable and environmentally sustainable energy system and post-Copenhagen solutions to limit the global temperature increase to 2°C and how these actions would impact oil markets and renewable energy. It presents updated projections to 2035 of energy demand, production, trade and investment by fuels and regions, and, for the first time, it includes the results from a new scenario based on governments' pledges to tackle climate change and growing energy insecurity.

#### **Military and Related Security Implications:**

WEO-2010 deserves careful study because it provides insights into the potential evolution of the current energy system and thus world energy security, as well as policies and alternatives for a more energy-efficient society.

#### **Source:**

World Energy Outlook 2010

<http://www.worldenergyoutlook.org/>

## APPENDIX

### Reference Details

This Appendix contains expanded background information on some items.

### Item 1. Strategic Plan for Biodiversity to Connect UN Conventions and UN Bodies

Acronyms and Abbreviations:

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species
CMS	Convention on Migratory Species
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MEAs	multilateral environmental agreements
Ramsar	Ramsar Convention on Wetlands
UNCCD	UN Convention to Combat Desertification
UNFCCC	UN Framework Convention on Climate Change
WHC	World Heritage Convention

### Item 7. Updates on Previously Identified Issues

#### 7.3 Chinese Rare Earth Restrictions



Source: Digging in. *The Economist*, Sept. 2, 2010  
<http://www.economist.com/node/16944034>

## 7.8 Climate Change

**Sources:** (a more expanded list)

### 7.8.1 Scientific Evidence and Natural Disasters

Medvedev's Climate Moment

<http://www.themoscowtimes.com/mobile/article/413772.html> (Subscription required)

Record Heat Spawns Stronger Hurricanes Over Atlantic

<http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/09/21/bloomberg1376-L91WX91A74E901-7919GG82QU9A38LTC82K8LVE8S.DTL>

National Hurricane Center

<http://www.nhc.noaa.gov/2010atlan.shtml>

### 7.8.2 Food and Water Security

925 million in chronic hunger worldwide

<http://www.fao.org/news/story/en/item/45210/icode/>

Food price volatility a major threat to food security

<http://www.fao.org/news/story/en/item/45690/icode/>

Food Commodities Speculation and Food Price Crises

[http://www.srfood.org/images/stories/pdf/otherdocuments/20102309\\_briefing\\_note\\_02\\_en.pdf](http://www.srfood.org/images/stories/pdf/otherdocuments/20102309_briefing_note_02_en.pdf)

ActionAid report "Who's really fighting hunger?"

<http://www.actionaid.org/assets/pdf/ActionAid-scorecard-report-2010.pdf>

The UK Food Group meeting– Securing Future Food

[http://www.ukfg.org.uk/docs/Securing\\_Future\\_Food\\_Draft\\_Agenda.pdf](http://www.ukfg.org.uk/docs/Securing_Future_Food_Draft_Agenda.pdf)

UN warned of major new food crisis at emergency meeting in Rome

<http://www.guardian.co.uk/environment/2010/sep/24/food-crisis-un-emergency-meeting-rome>

As food prices jump, UN group tries to avoid fuelling new crisis

<http://www.theglobeandmail.com/globe-investor/potash/rising-food-prices-key-to-battle-for-potash-corp/article1697548/>

*Rising Global Interest in Farmland: Can It Yield Sustainable and Equitable Benefits?* Report

[http://siteresources.worldbank.org/INTARD/Resources/ESW\\_Sept7\\_final\\_final.pdf](http://siteresources.worldbank.org/INTARD/Resources/ESW_Sept7_final_final.pdf)

New World Bank Report Sees Growing Global Demand for Farmland. Risks and Opportunities for the Developing World

<http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,contentMDK:22694767~pagePK:64257043~piPK:437376~theSitePK:4607,00.html>

Take Action to Stem Risks of Overseas Agriculture Investments, Warn Groups

<http://ictsd.org/i/news/biores/84541/>

The paper "Water Storage in an Era of Climate Change: Addressing the Challenge of Increasing Rainfall Variability"

[http://www.iwmi.cgiar.org/Publications/Blue\\_Papers/PDF/Blue\\_Paper\\_2010-final.pdf](http://www.iwmi.cgiar.org/Publications/Blue_Papers/PDF/Blue_Paper_2010-final.pdf)

### 7.8.3 Adaptation

UNESCAP Press Release: <http://www.unescap.org/unis/press/2010/sep/g39.pdf>

World Disasters Report 2010 - Is urban the new rural?

<http://www.ifrc.org/publicat/wdr2010/index.asp>

#### 7.8.4 Arctic Dialogue

Putin identifies Russia's priorities in Arctic

<http://www.itar-tass.com/eng/level2.html?NewsID=15522974&PageNum=0>

Russia to draw up new Arctic atlas

<http://en.rian.ru/science/20100922/160679591.html>

The Arctic: Territory of Dialogue

<http://www.arctic.ru/>

Northeast Passage and Maritime Security

<http://blog.usni.org/2010/09/03/northeast-passage-and-maritime-security/>

Ninth Conference of Parliamentarians of the Arctic Region, European Parliament, Brussels, 13-15 September 2010. CONFERENCE STATEMENT

<http://www.europarl.europa.eu/arcticparl/Conference%20statement,%20Final%20draft%20as%20adopted.pdf>

9th Conference of Arctic Parliamentarians, European Parliament, Brussels, Belgium

<http://www.europarl.europa.eu/arcticparl/>

#### 7.8.5 Post-Copenhagen Negotiations

Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol  
Fourteenth session, Tianjin, 4–9 October 2010

<http://unfccc.int/resource/docs/2010/awg14/eng/12.pdf>

### **7.9 Nanotechnology Safety Issues**

More detailed descriptions of the nanotechnology issues

#### 7.9.1 OECD Report Sums Up Current Developments in Nanomaterial Safety

According to *Nanowerk News*, "a new document from the OECD, Current Developments/Activities on the Safety of Manufactured Nanomaterials, provides information on current/planned activities related to the safety of manufactured nanomaterials in OECD member and non-member countries that attended at the 7th meeting of OECD's Working Party on Manufactured Nanomaterials (Paris France, 7-9 July 2010)", as well as written reports on relevant current activities in other international organizations such as International Organization for Standards (ISO), FAO, and the WHO.

#### **Military and Related Security Implications:**

This 86-page report provides a wealth of useful information on the current state of nanotech risk assessment.

#### **Sources:**

New OECD report sums up current developments on nanomaterial safety

<http://www.nanowerk.com/news/newsid=18180.php>

Environment Directorate Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology

[http://www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono\(2010\)42&doclanguage=en](http://www.oecd.org/officialdocuments/displaydocument/?cote=env/jm/mono(2010)42&doclanguage=en)

### 7.9.2 EPA Issues Final Significant New Use Rules (SNUR) on Carbon Nanotubes

The EPA has issued final Significant New Use Rules (SNUR) for single- and multi-walled carbon nanotubes, which had been the subject of premanufacture notices (PMN P08177, P08328). Persons who intend to manufacture, import, or process either of these materials for a use that is designated as a significant new use by the final rule must notify EPA at least 90 days before commencing that activity. EPA states that it believes the SNURs are necessary because these chemical substances may be hazardous to human health and the environment.

#### **Military and Related Security Implications:**

Organizations involved with nanotube environmental health and safety (EHS) should review these modified rules to determine their effects on R&D, procurement, and operations. The modifications provide clarifications on exemptions from applicability of the SNUR, and additional human health and environmental summary information to support EPA's findings.

#### **Sources:**

75 FR 56880 - Multi-Walled Carbon Nanotubes and Single-Walled Carbon Nanotubes; Significant New Use Rules

<http://www.gpo.gov/fdsys/granule/FR-2010-09-17/2010-23321>

EPA Issues Final SNURs for Carbon Nanotubes

<http://nanotech.lawbc.com/2010/09/articles/united-states/federal/epa-issues-final-snurs-for-carbon-nanotubes/>

### 7.9.3 EU Gearing Up for Active Nanotech Regulatory Year in 2011

*Nanowerk News* reported on a conference, held within the framework of the Belgian Presidency of the EU, on the development of nanomaterials management and information tools. The Belgian Minister for Energy, Environment, Sustainable Development and Consumer Protection stated, "We await the next European Environment and Health Action Plan which is expected to address the challenge of nanomaterials among its priority areas. In 2011, the Commission will also have to respond to the European Parliament Resolution adopted in April 2009, on the regulatory aspects of nanomaterials. According to the resolution, various ambitious measures will be taken in order to ensure safety with regard to nanomaterials and nanotechnology." The Minister put forward proposals for five specific responses.

#### **Military and Related Security Implications:**

Organizations concerned with nanotech EHS should be preparing for a large amount of regulatory study, discussion, and activity in Europe in 2011.

#### **Source:**

Regulation of products containing nanomaterial: Traceability, a pre-condition to acceptability

<http://www.nanowerk.com/news/newsid=18061.php>

### 7.9.4 European Officials Discuss Nanotech Regulation

Government officials from Germany, Austria, Switzerland, and Liechtenstein met at the 4<sup>th</sup> International Nano Authorities Dialogue, organized by the Innovation Society, St.Gallen, focusing on legal and technical issues about the insurability and regulation of nanotechnologies. According to a news release, key elements of the presentations were that "nanotechnologies must be insurable, ...the potential risks of manufactured nanomaterials for human health and the environment must be thoroughly and continuously monitored, and ... the exchange of safety

information between the industry and the authorities and along the value chain plays an important role to ensure that risks are identified in an early phase and measures can be taken proactively."

**Military and Related Security Implications:**

The discussions indicate the major concerns of the German-speaking segment of the European nanotech regulatory community. Military organizations and contractors operating in Europe, especially in Germany, need to consider how these developments might affect them through Status of Forces agreement EHS provisions.

**Sources:**

Insurability of nanotechnologies - regulatory gaps identified, risk monitoring requested

<http://www.nanowerk.com/news/newsid=18193.php>

Authorities Discuss Insurability of Nanotechnologies – Regulatory Gaps Identified, Risk Monitoring Requested

<http://nanotechwire.com/news.asp?nid=10594>

**7.9.5 Risk Assessment Study - Nanotechnology and Food Safety**

The Centre for Food Safety of the Government of Hong Kong has published a comprehensive 39-page literature review, Risk Assessment Study - Nanotechnology and Food Safety, accompanied by a PowerPoint presentation.

**Military and Related Security Implications:**

This publication should serve as a most useful introduction to nanomaterials in general and to the current state of knowledge (or lack thereof) on the risks of nanomaterials in food.

**Source:**

Nanotechnology and Food Safety – Report

[http://www.cfs.gov.hk/english/programme/programme\\_rafs/programme\\_rafs\\_ft\\_01\\_04.html](http://www.cfs.gov.hk/english/programme/programme_rafs/programme_rafs_ft_01_04.html)

**7.9.6 Lack of Nanoparticle Characterization Obstructs Development of Nanomedicines**

An item in *NatureNews*, discussing the recent first international workshop on nanotech medicines held by the European Medicines Agency (EMA) in London, reports on statements by several experts that the lack of reliable characterization techniques for nanoparticles, and the consequent inability to analyze and understand nanoparticle/biosystem interactions and possible hazards, are obstructing the development of nanomedicines.

**Military and Related Security Implications:**

The environmental security community should take very serious note of these opinions, as the negative consequences of these information gaps apply equally to the use of nanomaterials in products other than medicines. Every effort should be made to improve the states of characterization technology and nano/bio interaction studies.

**Source:**

Tiny traits cause big headaches. Nanotech medicines held up by lack of particle characterization.

<http://www.nature.com/news/2010/100914/full/467264b.html>

#### 7.9.7 Review Points Out “Nanomaterial” Definition Problem

Reporting on a recent nanotech workshop in the UK, [foodqualitynews.com](http://www.foodqualitynews.com) concurs with the workshop’s conclusion that "Agreeing on a legal definition of nanomaterials that satisfies food manufacturers, regulators, enforcement bodies and consumers will be hugely challenging." The EU has one definition in the Cosmetics Regulation, the latest draft of the revised Novel Food Regulation contains another, and a third is being developed by the EC's independent Scientific Committee for Emerging and Newly Identified Health Risks. Factors involved include size, shape, functionality, and (lack of) similarity to non-nano versions of the same substance. A side issue is what purpose is served by "nano-labeling" of products, if the safety implications of that characterization are uncertain.

#### **Military and Related Security Implications:**

Organizations involved with nanotechnology and the environment should constantly be aware of the fact that the "nano" part of "nanotechnology" may not even be a well-defined term in a particular context!

#### **Source:**

Nano definition is a legal minefield, warn scientists

<http://www.foodqualitynews.com/Legislation/Nano-definition-is-a-legal-minefield-warn-scientists>

#### 7.9.8 Engineered Nanoparticles: Occupational Health and Safety (OHS) Risks and Prevention Measures

The Institut de recherche Robert-Sauvé en santé et en sécurité du travail in Montreal has released the second edition of its report, *Engineered Nanoparticles: Current Knowledge about Occupational Health and Safety Risks and Prevention Measures*. According to *Nanowerk News*, the 153-page report concludes, "As for health hazards, many toxicological studies on different substances have demonstrated toxic effects on various organs. It is found that in general, an NP will normally be more toxic than the same chemical substance of larger dimensions, but it is currently impossible to determine which measuring parameter for exposure is best correlated with the measured effects." It also calls for a preventive and even precautionary approach and emphasizes the enormous need for developing new knowledge.

#### **Military and Related Security Implications:**

This comprehensive work should be of great value in evaluating the current state of nanotech risk assessment and in planning future research.

#### **Sources:**

Engineered Nanoparticles. Current Knowledge about OHS Risks and Prevention Measures

<http://www.irsst.qc.ca/files/documents/PubIRSST/R-656.pdf>

New report on engineered nanoparticle risk

<http://www.nanowerk.com/news/newsid=18142.php>

#### 7.9.9 Discussion on Federal/State Regulation of Nanotech

A recent article in *Nanotechnology Now*, *We Should Have Seen It Coming: States Regulating Nanotechnology*, discussed the increasing trend for individual states to consider or enact nanotech regulations, reflecting a discontent with actions (or inaction) on the part of the federal government. A subsequent piece, *State-level nano regulation: Yes, indeed, the industry "should have seen it coming" – it caused it!*, appeared in an Environmental Defense Fund blog, and



attributed that trend indirectly to the nanotech industry's efforts to block or weaken federal controls.

**Military and Related Security Implications:**

These discussions offer useful insights into the history, current state, and possible future course of state and federal regulation of nanotechnology.

**Sources:**

We Should Have Seen It Coming: States Regulating Nanotechnology

<http://www.nanotech-now.com/columns/?article=484>

State-level nano regulation: Yes, indeed, the industry "should have seen it coming" – it caused it!

<http://blogs.edf.org/nanotechnology/2010/09/10/state-level-nano-regulation-yes-indeed-the-industry-should-have-seen-it-coming-%E2%80%93-it-caused-it/>

**7.9.10 German Risk Assessment Body Publishes Three Nanotech Reports**

BfR, the German Federal Institute for Risk Assessment, has published three reports on German opinions and attitudes about nanotechnology-related risks.

*Delphi Study on Nanotechnology: Expert Survey of the Use of Nanomaterials in Food and Consumer Products* discussed nine general risk criteria and nine nano-specific test criteria.

*Perception of Nanotechnology in Internet-based Discussions: The risks and opportunities of nanotechnology and nanoproducts: results of an online discourse analysis* according to *Nanowerk News*, has as its purpose “to analyse German-language online discussions of nanotechnology in an attempt to identify the perceived risks, opportunities, benefits and expectations associated with this field of research and development.”

*Risk Perception of Nanotechnology – Analysis of Media Coverage* report examines 2001-2007 media coverage of nanotechnology in almost 1700 articles published in German newspapers and magazines.

**Military and Related Security Implications:**

These reports can offer excellent insights into Germans' opinions and attitudes about nanotech risk, and by extension, perhaps European, experts and lay personnel. While attitudes constantly evolve, this information should prove valuable in identifying and responding to both valid and invalid concerns.

**Source:**

German Federal Institute for Risk Assessment publishes three new reports on nanotechnology

<http://www.nanowerk.com/news/newsid=17898.php>

**7.9.11 Nanosilver Compound Turns Up in Municipal Wastewater**

According to an Environmental Defense Fund blog, scientists in The Center for NanoBioEarth at Virginia Tech identified and characterized silver sulfide\* nanoparticles in the sewage sludge produced by an operating municipal wastewater treatment plant. This is the first time that such material has been detected in a field-scale study. It is not certain, although stated as "likely", that the material detected in the sludge originated from products containing silver nanoparticles that were converted to sulfides in the processing.

\* - The blog post incorrectly identifies the nanoparticles as potentially toxic silver rather than the correct characterization as inert silver sulfide, as stated in the original paper.

**Military and Related Security Implications:**

These findings once again emphasize the requirement for extensive continuing research into the environmental connections in the life cycle of nanoproducts and derivatives, from original production through use, discard, and eventual disposal; as, for example, an ingredient in sludge used for agricultural fertilization. An indication of the uncertain situation in this regard is the recent appeal by the National Association of Clean Water Agencies asking the EPA not to conditionally approve the use of nanoscale silver as a preservative in textile products as it does not have the scientific basis to conclude the use would not cause harm.

**Sources:**

Sludging through the nano lifecycle: Caution ahead

<http://blogs.edf.org/nanotechnology/2010/09/23/sludging-through-the-nano-lifecycle-caution-ahead/>

Discovery and Characterization of Silver Sulfide Nanoparticles in Final Sewage Sludge Products

<http://pubs.acs.org/doi/abs/10.1021/es101565j>

**7.9.12 French Lab to Be Set up for Study of Nanotube Toxicity in Aqueous Environments**

A French component of the international firm Arkema, together with the Centre national de la recherche scientifique (CNRS), the Institut National Polytechnique de Toulouse, and the Université Paul Sabatier have agreed to establish a joint research laboratory, NAUTILE (NAnotUbes et écoToxIcoLogiE), dedicated to the study of the ecotoxicological impact of carbon nanotubes (CNTs) in aquatic environments.

**Military and Related Security Implications:**

Components dealing with nanotech risk assessment should establish liaison with this laboratory after it begins operations, in order to be able to profit from the results of its research.

**Source:**

NAUTILE: the first research laboratory for the study of the ecotoxicity of carbon nanotubes in the aquatic environment

[http://prodawl.arkema.com/sites/group/en/press/pr\\_detail.page?p\\_filepath=/templatedata/Content/Press\\_Release/data/en/2010/100910\\_nautile\\_the\\_first\\_research\\_laboratory\\_for\\_the\\_study\\_of\\_the\\_ecotoxicity\\_of\\_carbon\\_nanotubes.xml](http://prodawl.arkema.com/sites/group/en/press/pr_detail.page?p_filepath=/templatedata/Content/Press_Release/data/en/2010/100910_nautile_the_first_research_laboratory_for_the_study_of_the_ecotoxicity_of_carbon_nanotubes.xml)